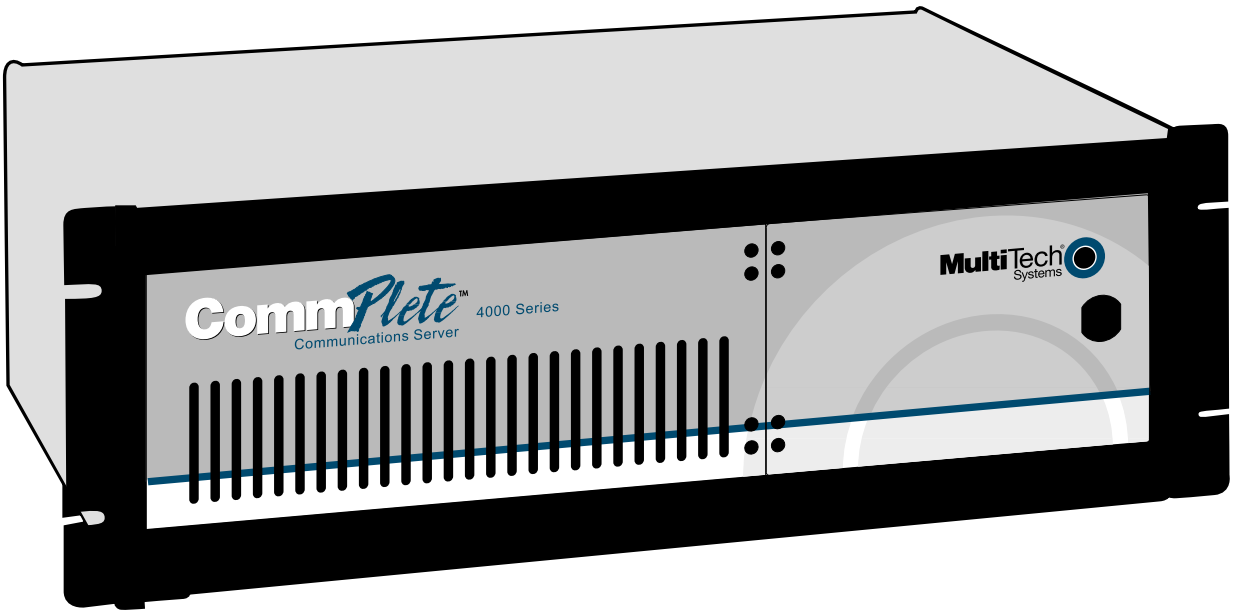
CommPlete 4000 Communications Server



Quick Start Guide

MultiTech® Systems

CommPlete 4000 Communications Server
Quick Start Guide

82098882, Revision C

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1 System Overview

System Overview

Introduction

The CommPlete™ 4000 Communications Server is a single-segment, rack mountable communications server. It is customized for dedicated turnkey operation of LAN-based communications and remote access server functions. The CommPlete 4000 is a general purpose server that easily interfaces to any existing Novell, Windows NT, or IP network.

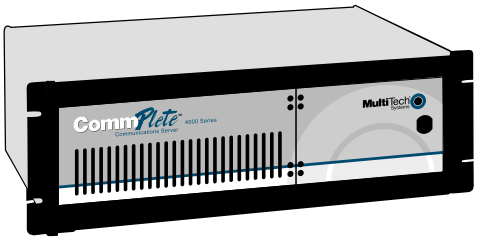


Figure 1-1. CommPlete™ 4000 Communications Server

Product Overview

The CommPlete 4000 is a ruggedized, highly expandable 19" rack mount device that includes a built-in hard drive, 3.5" floppy drive, and a slot for a CD-ROM drive. It has five circuit-board slots: four are PCI compatible, and one accommodates either a PCI or ISA card. (Each CommPlete 4000 model is shipped with a Network Interface Card and a MultiModem ISI card. These occupy two slots, leaving three slots for expansion cards.) A separate slot supports the single board computer (SBC) that is the heart of the system. A user configurable card cage allows for up to 32 V.90 (56kbps, KFlex) internal modems or up to 32 high speed serial ports. The CommPlete 4000 is shipped with factory-installed RAS*Express* server software for remote-access functionality. Each CommPlete 4000 has a default configuration that allows it to boot as a RAS unit. Additional software for authentication service and network modem port allocation are also included.

The four CommPlete 4000 models differ according to the serial interface card used. The different serial interface cards offer, variously, serial ports for external modems, built-in modems, or built-in modems and terminal adapters:

Model CC4S-8 with the ISI4608PCI serial card -- has serial port connections for eight external modems.

Model CC4M-8 with the ISI5634PCI/8 serial card -- has eight built-in modems

Model CC4H-4S with the ISIHIP-4S serial card -- provides four ISDN terminal adapters using the S interface as well as eight analog modems (allowing eight concurrent sessions)

Model CC4H-4U with the ISIHP-4U serial card -- provides four ISDN terminal adapters using the U interface as well as eight analog modems (allowing eight concurrent sessions)

The CommPlete 4000 has expansion capability for up to three additional MultiModem ISI circuit cards (for additional modems/TAs). When multiple serial-interface cards are used, the CommPlete accommodates or includes as many as 32 communications devices. While it is most common to use multiple ISI cards all of the same type, you can equip a single CommPlete 4000 unit with more than one type of ISI card.

*RAS*Express and Auxiliary Software

The CommPlete 4000 is equipped with factory installed RAS*Express*, an advanced remote access software that enables network managers to configure and manage remote servers via web browsers, through Telnet over an IP network, and via a GUI manager over both IP and IPX networks. Through a special software package bundled with the CommPlete 4000, RAS*Express* can also be interfaced to standard Radius authentication functionality (which resides on a separate PC).

RADIUS authentication software (Remote Authentication Dial-In User Service) handles authentication and profile information about network users and secures against unauthorized server access. Built-in R log protocol support permits remote log-in to all hosts on the network. RAS*Express* can facilitate remote software upgrades via standard TFTP protocol.

The CommPlete 4000's workstation re-director programs (WINMCSI and MCSIWSN) control modem port assignments on the network.

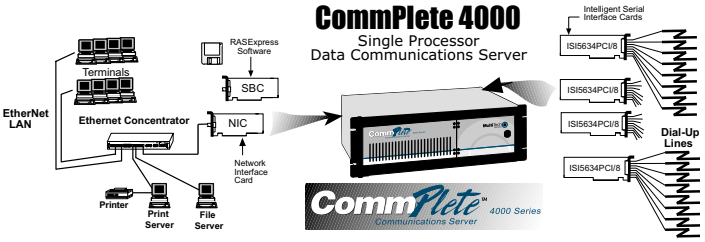


Figure 1-2. Typical RAS*Express* Application - *Dial-In Remote Access*

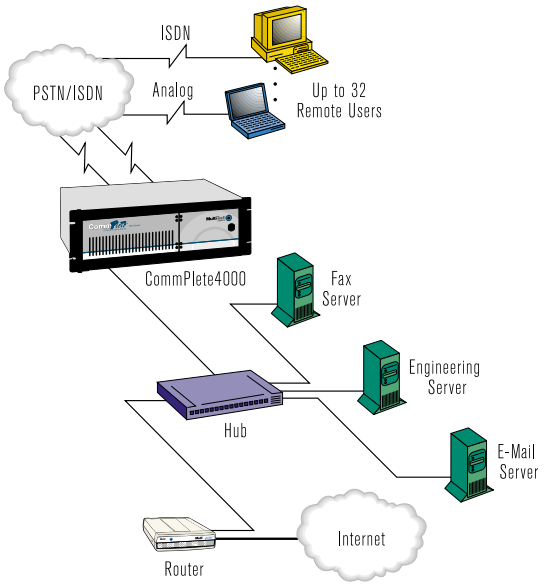


Figure 1-2b. Typical RASExpress Application - *Dial-Out Services*

Additional noteworthy features of RAS*Express* include include:

- Support for DHCP, a time saving feature that dynamically allocates IP addresses instead of requiring network managers to allocate them manually
- Built-in SNMP agent enables third-party SNMP manager to administer the box
- Support of IP and IPX header compression and IP VJC header compression for increased performance

- Call back support for Windows 95 client
- Remote Access Security on a per use basis for accessing IP only, IPX only, or both IP and IPX
- Keyboard or mouse operation
- Standard or User-defineable cover page
- Built-in web, telnet, and FTP access

Documentation Set Overview

The CommPlete 4000 documentation set includes individual hardware and software manuals on CD-ROM. Updates are available from the Multi-Tech web site, FTP site, and BBS.

Individual titles in your CommPlete 4000 documentation set include the following:

- CommPlete 4000 Quick Start Guide
- System Overview (CommPlete 4000 Chassis manual)
- Single Board Computer User Guide
- PCI Ethernet Network Interface Card (10/100Mb)
- RAS*Express* User Guide
- V.110 Product Update for ISI products
- Serial Card documentation: ISI4608PCI, ISI5634PCI/8, ISIHP-4S, ISIHP-4U

Technical Specifications

The CommPlete 4000 conforms to the following technical specifications.

Chassis

- 6-slot PCI/ISA backplane
- SBC
- 10/100Mb PCI EtherNet NIC
- One half-height 1.44Mb 3½-inch floppy disk drive
- One half-height IDE hard disk drive
- One power supply
- Power on/off switch on front panel with built in power LED.
- Full security locking
- Intelligent Serial Interface card with or without modems/TAs (ISI4608PCI, ISI5634PCI/8, ISIHP-4S, or ISIHP-4U)

Power Supply

AC Input

- Power requirement: 115/230V; 7A/4A (RMS) selectable by slide switch
- Frequency: 50-60 Hz
- Efficiency: >65% @ full load, nominal line

DC Output

- Output: +5 @ 25A
  +12 @ 10A
  -5 @ 0.5A
  -12 @ 0.5A
- Inrush current: <30A peak @ 115VAC, cold start at 25° C
- Line regulation: +/- 5% at full load for +/-5V, +/-12V, +/-10% for -12V
- Hold Time: 12ms at full load @ 115VAC

Dimensions

- Height: 5.25 inches
- Width: 19 inches
- Depth: 17 inches
- Weight: 31 lbs. (14kg)

Environmental

- Temperature: 0–40° C
- Humidity: 10–90% RH noncondensing
- Fan Rating: 25 cfm

2 Installing Your CommPlete 4000

Introduction

This chapter explains how to set up and connect cables for the CommPlete 4000. This product is ready to be connected to the end-user's Ethernet concentrator. It is preconfigured to operate as a communications server. The operator must make modem/terminal-adapter connections, link up the VGA monitor and keyboard, boot the system, and enter some basic information. To connect the cables to the SBC, NIC, or ISI board, see the *Cable Connections* section of this chapter.

Unpacking

Check the items on the CommPlete 4000 shipping list to ensure that you have received the correct options and accessories. Unpack the unit and inspect it for visible shipping damage. If damage is observed, do not power-on the unit; contact Multi-Tech's Tech Support for advice. If no damage is observed, place the CommPlete 4000 in its final location.

Safety Warning AC Power

Locate the AC outlet near the communication equipment. The AC power cord is your main AC disconnecting device and must be easily accessible at all times. For your safety, the power cord provided with your system has a grounding plug. Always use the power cord with a properly grounded wall outlet to avoid the risk of electrical shock.

Lithium Battery Caution

A lithium battery on the product provides backup power for the device's timekeeping capability. The battery has an estimated life expectancy of ten years.

When the battery starts to weaken, the date and time may be incorrect. If the battery fails, the unit must be sent back to Multi-Tech Systems for battery replacement.

Warning: There is danger of explosion if the battery is incorrectly replaced.

Laser Safety Caution

Class 1 LED Product.

The CD-ROM drive contains a laser system and is classified as a "Class 1 Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968.

If the unit ever requires maintenance, contact an authorized repair location.

Safety Warnings Telecom

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. This product is to be used with UL and cUL listed computers.
4. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
5. Use caution when installing or modifying telephone lines.

6. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.

7. Do not use the telephone to report a gas leak in the vicinity of the leak.

8. To reduce the risk of fire, use only No. 26 AWG or larger Telecommunications line cord.

Rack Mounting

***Caution**: To prevent personal injury or damage to the unit, two people should mount the CommPlete 4000 into the rack enclosure.*

The CommPlete 4000 fits in a standard 19-inch rack enclosure. Attach it securely to the rack enclosure with the four mounting screws included in your CommPlete 4000 kit.

When mounting the equipment in the rack, make sure mechanical loading is even. Uneven mechanical loading creates the risk that the equipment rack may tip or fall or present other related hazards. The rack should safely support the combined weight of all the equipment that it holds.

***Note**: To keep the server cool enough, you need at least one inch of clearance behind the unit to allow air flow. If mounted in a rack enclosure or as a desktop unit, there must be a minimum of one inch between the back of the CommPlete 4000 and any wall or barrier.*

Cable Connections

The operator must connect the Network Interface Card to the network and the serial interface card(s) to their related external devices or telephony connections. If the ISI5634PCI/8 is used, the supplied special cables with two sizes of modular phone plugs must be used to connect that board's built-in modems to the phone lines.

If the ISI4608PCI is used, connections between it and external modems are made via the supplied octopus cable going between the DB-78 connector on the ISI4608PCI board and the DB-25 connectors on the individual modems. (RJ-11 connectors connect the modems to the phone jacks.)

If the ISIHP-4S or -4U are used, note that each ISIHP card accepts as many as four RJ-45 connectors to accommodate ISDN BRI lines. (The modem connections that accommodate analog calls are internal to the ISIHP board. That is, when the V.90 modem module is installed, each ISDN B-channel connects to a V.90 modem via a digital connection. These digital connections allow analog callers using 56K modems to receive 56k downloads from the ISIHP's modems.)

The SBC board has cable connectors for adding a monitor, a keyboard, and a mouse or other serial device (on COM1). Cable connectors and boards are shown in Figure 2-1.

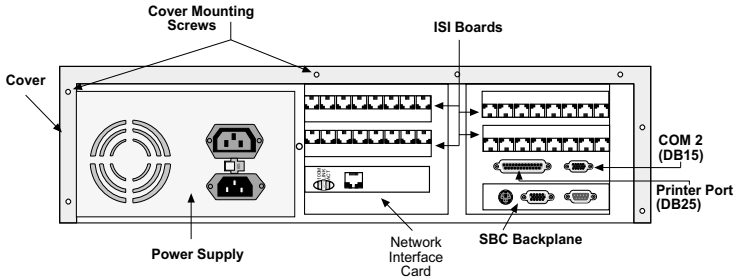


Figure 2-1. Back Panel Connectors

SBC Board Cabling

The SBC board is located in the CommPlete 4000 as shown in Figure 2-1. The SBC board cabling may involve connection to three back panel connectors (see Figure 2-2). The back panel connectors are:

- Video connector
- COM 1 connector
- Keyboard connector

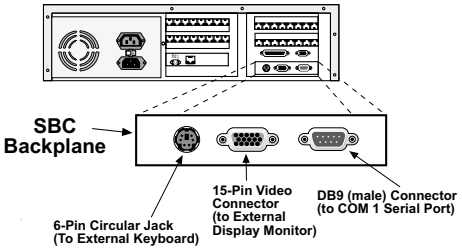


Fig. 2-2. SBC Backplane Connections

The right connector (COM 1) on the SBC's backplane typically accommodates a mouse or other pointing device. The middle receptacle connects the video cable to a monitor. The left round connector is for the keyboard.

Note: *Any cables connected to the CommPlete 4000 should be shielded to reduce interference.*

ISI Board Cabling

Each Intelligent Serial Interface card (ISI5634PCI/8, ISI4608PCI, or ISIHP-2S/2U) takes up one physical slot in the CommPlete 4000. Depending on your configuration, you may have as many as four of these cards (see Figure 2-1). Attach the line cords (RJ-12 for analog phone lines; RJ-45 for ISDN phone lines) to the line connectors on the ISI card(s) at the back of your CommPlete 4000 as shown in Figure 2-3.

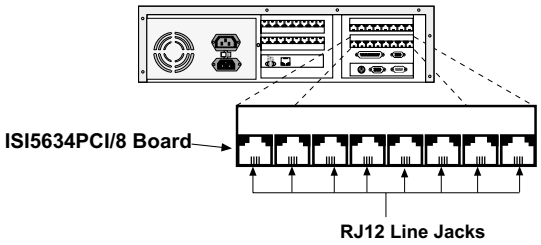


Figure 2-3: ISI Board Connectors (ISI5634PCI/8 shown; other MultiModem ISI cards differ)

Note: *Any cables connected to the CommPlete 4000 should be shielded to reduce interference.*

Note that the two top expansion slots share a data interrupt signal on the PCI bus. Consequently, if both slots are used, they must be occupied with identical devices (and the device drivers must be identical). This is a constraint of PCI bus architecture. Also, the device drivers must support "interrupt-sharing." The drivers for the MultiTech ISI card do support interrupt-sharing

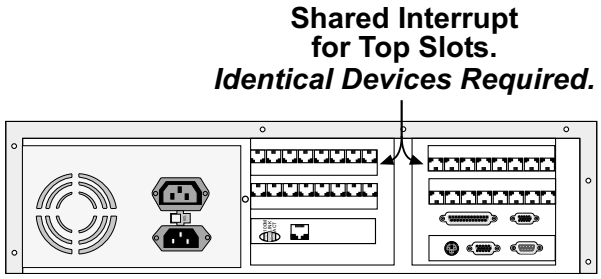


Figure 2-3b. Top Slots Require Identical Devices

Serial Card Upgrades

As shown in Figure 2-3c, installation of expansion cards is simpler in the outer slots than in the inner expansion slot.

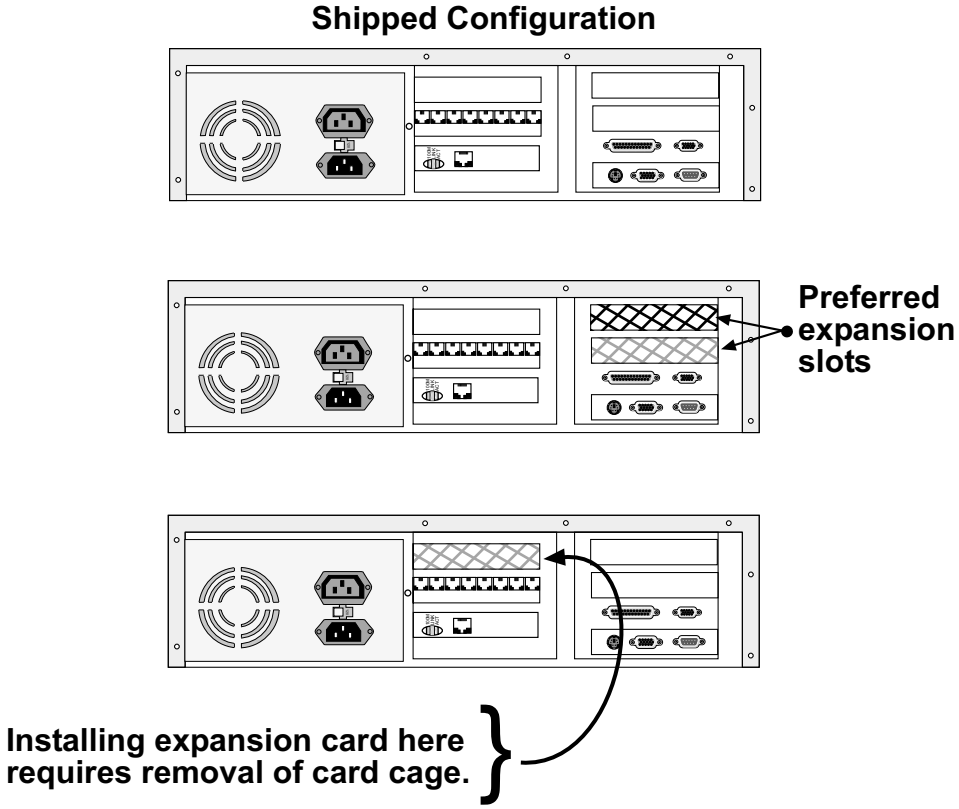


Figure 2-3c. Convenience of using outer expansion slots before the inner slot

NIC Cabling

The 10/100Mb PCI EtherNet Network Interface Card is located as shown in Figure 2-4. The NIC has a single RJ-45 connector and three LEDs.

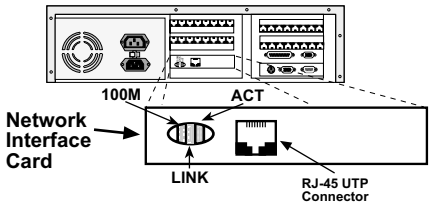


Fig. 2-4. NIC Board Connectors

Connect the appropriate network cable to the NIC in the CommPlete 4000. The RJ-45 NIC connector is shown and defined in Appendix A.

Note: *Any cables connected to the CommPlete 4000 should be shielded to reduce interference.*

Powering Up

Note: This is pluggable equipment; the socket outlet must be installed near the equipment and must be easily accessible.

When connecting the equipment to the power-supply circuit, be sure to check equipment nameplate ratings to avoid overloading circuits. Overloaded circuits may cause damage to over-current protection devices and to power-supply wiring.

Make sure that the voltage selector on the power supply is set to the proper voltage prior to connecting this equipment to the main power. If the voltage selector needs to be changed, an ordinary pencil can be used to change the switch to the position which best correlates with the known input voltage. If the voltage selector is in the "115" position, input voltages from 100-120VAC may be applied to the equipment. If the voltage selector is in the "230" position, input voltages from 200-240 VAC may be applied to the equipment.

Connect the power cord supplied with the CommPlete 4000 to the power cord connector on the back of the cabinet and to an AC outlet. Press the power switch on the front of the cabinet to the ON position. The power switch contains an LED which should light when power is applied.

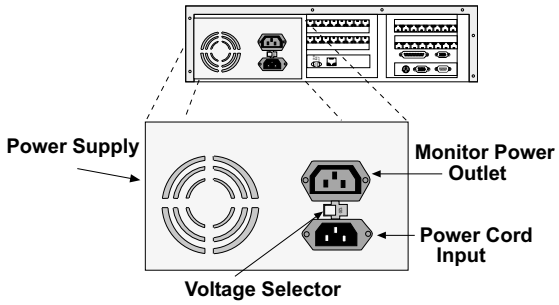


Fig. 2-5. Power Supply Connectors

3 Getting Started with RASExpress

Quick Start with RAS*Express*

MultiTech Systems has preinstalled RAS*Express* server software on your CommPlete 4000 to make configuration as simple as possible. For your convenience, a copy of the RAS*Express* Installation program is on the CD-ROM shipped with the CommPlete 4000. Complete the procedure below to put your CommPlete 4000 into operation as a Remote Access Server.

What you need to start

- The CommPlete 4000 Server
- A dumb terminal or an auxiliary PC (other than the CommPlete 4000 itself) that can operate in terminal mode
- A shielded RS-232C serial cable with a female DB-9 connector on one end and a connector to match the serial port of the terminal or auxiliary PC on the other end (supplied)
- An IP Address assigned to the CommPlete 4000 server
- An IP Subnet Mask assigned to the CommPlete 4000 server
- *Optional:* a client PC connected to the CommPlete 4000's network and equipped with Telnet, a browser, or MultiManager

Accessing RAS*Express*

To configure the CommPlete 4000 as a RAS*Express* server, you must first connect a terminal or auxiliary PC to the CommPlete 4000's serial port. Then you must enable **IP Remote Access** and program the **IP Address** and **IP Subnet Mask** into the CommPlete 4000. After the IP Address and IP Subnet Mask have been entered into the CommPlete 4000, you can either:

(a) continue using the terminal or auxiliary PC to program other network settings into the CommPlete 4000, or
(b) re-boot the CommPlete 4000 and then continue programming the CommPlete 4000's network settings from a client PC connected to the LAN in which the CommPlete 4000 is the RAS server. Do this using Telnet, or a browser, or MultiManager.

The steps for both methods are presented below.

Method A. Do All Configuration using Terminal or Auxiliary PC

A1. Be sure that the CommPlete 4000 is connected to the LAN. Turn off the power for the CommPlete 4000.

A2. Using the provided RS-232C serial cable, connect a terminal (or an auxiliary PC) to the CommPlete 4000's serial port.

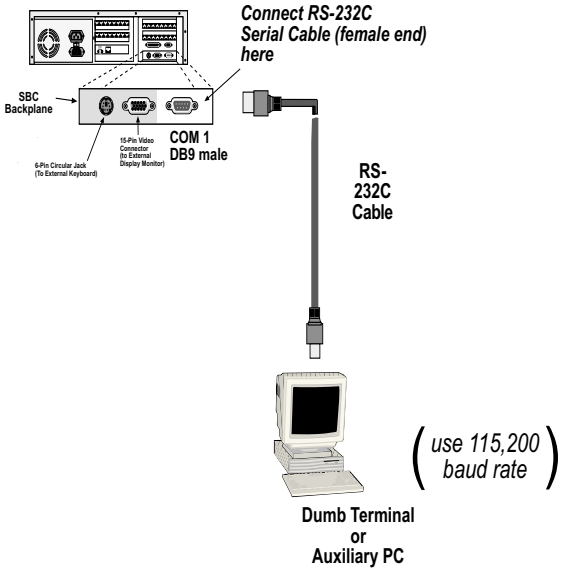


Figure 3-1: Serial port on the CommPlete 4000

A3. Power up the CommPlete 4000. The RAS*Express* Server Screen will appear.

Note: The server takes a few moments to load the RASExpress software and to initialize the modems after it is turned on. Observe RAS software processing and displaying .

A4. Turn on the terminal (or auxiliary PC) and press ▫▫▫▫▫.

A5. Select ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫.

A6. Enable ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫.

Note: Error messages will appear and will indicate that the remote addresses of the WAN ports are not on the same subnet. This is normal for the initial setup. Ignore these messages.

A7. Type the ▫▫▫▫▫▫▫▫▫▫▫ for the CommPlete RAS*Express* server.

A8. Type the ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫

A9. In the ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫field, enter the router address for the LAN's file server.

A10. If you want the RAS*Express* server to use IP Routing Information Protocol (RIP-2) for IP routing, enable ▫▫▫▫▫▫▫.

A11. If you have enabled IP-RIP, you may enable ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫

ii. Select Communication Setup.

iii. Select ISI Setup.

iv. Delete all ISI cards before saving and rebooting the server.

These steps correct the initial subnet error the next time the server loads.

If you set the ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫ to any of these values (▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫ ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫), go to step A15. If you selected ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫, you must configure the address pool. See the RAS*Express* User Guide.

A15. When the above steps are complete, press ▫▫▫ and save the changes to disk. You will be asked to re-boot the server.

A16. Type Y and press ▫▫▫▫▫. The connection closes while the RAS*Express* server re-boots. A new menu appears after the CommPlete 4000 has re-booted.

A17. To complete the configuration of the RASExpress server, select ▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫▫ ▫▫▫▫▫▫▫ from the main menu. For detailed information about the menu options, see Chapter 3 of the RAS*Express* manual.

Method B. Start Configuration with Terminal, Finish Configuration on Client PC

To enable remote configuration of the RASExpress server, you must first configure the server's IP settings, including the server's IP address. To do this, you must connect a terminal (or auxiliary PC) to the server's serial port. After IP is configured and working, you can complete the server configuration remotely through Telnet, through a browser, or through MultiManager on a client PC connected to the LAN.

B1. Be sure that the CommPlete 4000 is connected to the LAN. Turn off the power for the CommPlete 4000.

B2. Using the provided RS-232C serial cable, connect a terminal to the RASExpress server's configuration port.

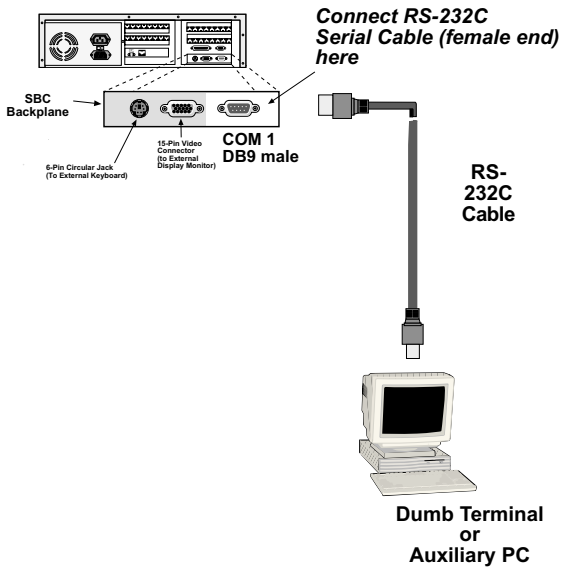

Connect RS-232C Serial Cable (female end) here
SBC Backplane
15-Pin Video Connector (to External Display Monitor)
COM 1 DB9 male
6-Pin Circular Jack (To External Keyboard)
RS-232C Cable
Dumb Terminal or Auxiliary PC

Figure 3-2: Serial port on the CommPlete 4000

B3. Power up the CommPlete 4000. The RAS*Express* Server Screen will appear.

Note: The server takes a few moments to load the RASExpress software and to initialize the modems after it is turned on. Observe RAS software processing and displaying .

B4. Turn on the terminal (or auxiliary PC) and press □□□□□.

B5. Select □□□□□

Auxiliary Software

RAS*Express* is often used in conjunction with Workstation Redirector software and RADIUS authentication software. The CommPlete 4000 is shipped with these auxiliary software packages. For information on the installation and use of these auxiliary software packages, see the Appendices.

Appendix B: Workstation Redirectors -- MCSIWSN & WINMCSI

Appendix C: RADIUS Authentication & User Profile Software

4 Service, Warranty & Technical Support

Introduction

This chapter opens with a description of your CommPlete 4000's 2-year warranty. The next section, Tech Support, should be read carefully if you have questions or problems with your CommPlete 4000. It includes the technical support telephone numbers, space for recording your CommPlete 4000 information, and an explanation of how to send in your CommPlete 4000 should you require service. The final section explains Multi-Tech's presence on the Internet.

Limited Warranty

Multi-Tech Systems, Inc. (*"MTS"*) warrants that its products will be free from defects in material or workmanship for a period of two years from the date of purchase, or if proof of purchase is not provided, two years from date of shipment. MTS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period, or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS.

Tech Support

Multi-Tech has an excellent staff of technical support personnel available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this unit, call 1-800-972-2439. Please fill out the information (below), and have it available when you call. If your CommPlete 4000 requires service, the tech support specialist will guide you on how to send in your CommPlete 4000.

Recording CommPlete 4000 Information

Please fill in the following information on your Multi-Tech CommPlete 4000 . This will help tech support in answering your questions.

CommPlete 4000 *Model No.:* _____

CommPlete 4000 *Serial No.:* _____

Application Software Type and Version (e.g., RASExpress + FAX Server)*:*

Please note the status of your CommPlete 4000 before calling tech support. This status can include screen messages, diagnostic test results, problems with a specific application, etc.

Service

If your tech support specialist decides that service is required, your CommPlete 4000 may be sent (freight prepaid) to our factory. Return shipping charges will be paid by Multi-Tech Systems.

Include the following with your CommPlete 4000:

- a description of the problem.
- return billing and return shipping addresses.
- contact name and phone number.
- check or purchase order number for payment if the CommPlete 4000 is out of warranty. (The standard repair charge for your CommPlete 4000 is $400. This price is valid at the time of this publication but could change in the future. Check with your technical support specialist.)
- if possible, note the name of the technical support specialist with whom you spoke.

If you need to inquire about the status of the returned product, be prepared to provide the **serial number** of the product sent.

Send CommPlete 4000s to this address:

MULTI-TECH SYSTEMS, INC.
2205 WOODALE DRIVE
MOUNDS VIEW, MINNESOTA 55112
ATTN: SERVICE OR REPAIRS

About the Internet

Multi-Tech is a commercial user on the Internet, and we retrieve e-mail messages from on a periodic basis. If you prefer to receive e-mail technical support via the Internet, you can contact Tech Support at the following address:

http://www.multitech.com/_forms/email_tech_support.htm

Multi-Tech's presence includes a Web site at:

http://www.multitech.com

and an ftp site at:

ftp://ftp.multitech.com

Appendices

Appendix A: Regulatory Information

Appendix B: WINMCSI Workstation Redirector

Appendix C: RADIUS Authentication & User Profile Software

Appendix A—Regulatory Information

FCC Regulations for Telephone Line Interconnection

1. This equipment complies with Part 68 of the Federal Communications Commission (FCC) rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN).
   If requested, this information must be provided to the telephone company.
2. As indicated below, the suitable jack (Universal Service Order Code connecting arrangement) for this equipment is shown. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.

   An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.
3. The ringer equivalence number (REN) is used to determine the quantity of devices that may be connected to the telephone line. Excessive REN's on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REN's, contact the telephone company to determine the maximum REN for the calling area.
4. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.
6. If trouble is experienced with this equipment (the model of which is indicated below) please contact Multi-Tech Systems, Inc. at the address shown below for details of how to have repairs made. If the equipment is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.
7. No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.
8. This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)
9. If so required, this equipment is hearing-aid compatable.

Manufacturer:	Multi-Tech Systems, Inc.
Model Number:	MA6RF7216-S
FCC registration number:	AU7USA-23834-MM-E
Ringer Equivalence No:	0.3B
	Modular Jack (USOC)
	RJ11C or RJ11W (single line)
Service Center in USA:	Multi-Tech Systems Inc.
	2205 Woodale Drive
	Mounds View, MN 55112
	Voice (763) 785-3500/
	FAX (763) 785-9874

Canadian Limitations Notice

Notice: The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination of a interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

Notice: The Industry Canada label identifies certificated equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Compliance with BABT Requirements

Approved for connection to telecommunications system specified in the instructions for use subject to the conditions set out in them.

Warning: Interconnection directly, or by way of other apparatus, of ports marked "SAFETY WARNING see instructions for use" with ports marked or not so marked may produce hazardous conditions on the network. Advice should be obtained from a competent engineer before such a connection is made.

It is a condition of approval that the power required by the host and the total of all adapter cards installed within the host environment, together with any auxiliary apparatus, does not exceed the power specification as stated in the Technical Reference Material of the host apparatus.

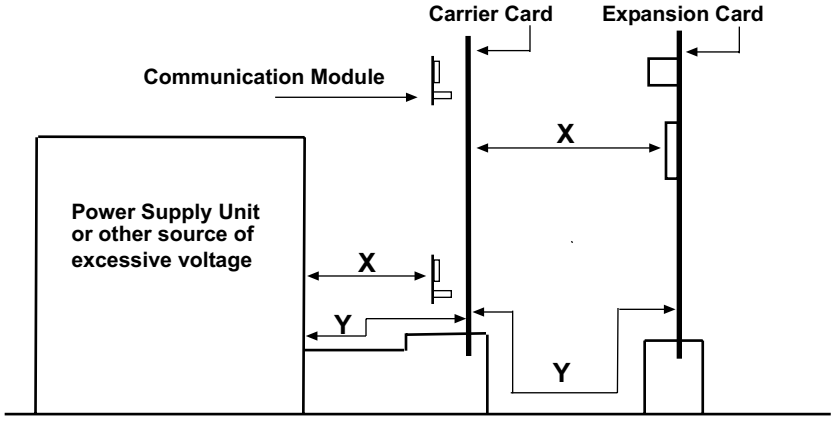
The power requirements for the MultiModem ISI are:

Modem operating voltages:	+12V D.C., -12V D. C., +5V D.C.
Modem power consumption:	8 Watts

In order to maintain the independent approval of this card, it is essential that when other option cards are introduced which use or generate a hazardous voltage, the minimum creepages and clearances specified in the following table are maintained. A hazardous voltage is one which exceeds 42.4V peak a.c or 50V d.c. If you have any doubt, seek advice from a competent engineer before installing other adapters into the host equipment.

The equipment must be installed such that with the exception of connection to the host, clearance and creepage distances shown in the following table are maintained between the card and any other assemblies which use or generate a voltage shown in that table. The larger the distance shown in brackets applies where the local environment within the host is subject to conductive pollution or dry nonconductive pollution which could become conductive due to condensation. Failure to maintain these minimum distances would invalidate approval.

Clearance (mm)	Creepage (mm)	Voltage Used or Generated by Host or Other Cards
2.0	2.4 (3.8)	Up to 50 Vms or Vdc
2.6	3.0 (4.8)	Up to 125 Vms or Vdc
4.0	5.0 (8.0)	Up to 250 Vms or Vdc
4.0	6.4 (10.0)	Up to 300 Vms or Vdc



Example Diagram Showing Creepage and Clearance Distances

Fig. A-1. Example Diagram Showing Creepage and Clearance Distances

Except at the edge connector which plugs into the host's expansion slot, clearance distance (Xmm) and creepage distance (Ymm) as given in the table above, must be maintained between the communication card and any assemblies which use or generate hazardous voltage.

This apparatus has been approved for the use of the following facilities:

- Auto-calling
- Loop disconnect and MF dialing
- Phone number storage and retrieval by a predetermined code
- Operation in the absence of proceed indication
- Automatic storage of last number dialed
- Tone detection-busy
- Auto clear from the originating end
- DTR dialing
- Modem
- PBX timed break register recall

European Low Voltage Directive

When correctly installed and maintained, the modem will present no hazard to the user. When correctly installed, the modem will be connected to the PSTN or a PW and to a Data Terminal Equipment (DTE) whose modem connections comply with CCITT recommendation V28. The DTE connections are therefore taken to be safe voltages (less than ± 30 volts).

Ports that are capable of connecting to other apparatus are defined as SELV. To ensure conformity with EN41003, ensure that these ports are only connected to ports of the same type on other apparatus.

Compliance with BS6305 Clause 6.2, BS6320 Clause 7.2, and BABT/SITS/82/005S/D

a. The modem is suitable for connection to the Public Switched Telephone Network (PSTN) provided by British Telecommunications plc or Kingston Communications (Hull) plc. Circuit supply by British Communications, Mercury Communication, or Hull City Council. Only direct exchange lines may be used, not shared service.

b. The modem is suitable for household, office, and similar general indoor use. It is not suitable for use as an extension to a payphone.

c. BT lines supplied must support either loop disconnect or multifrequency tone signalling.

d. REN (Ringer Equivalence Number).

The REN value of a unit is calculated from 3/n where n is the total number of units which can be connected in parallel which will still cause the standard bell (as defined in BS6305 Appendix D) to ring.

REN values of less than 0.3 cannot be assigned.

REN = 1

If a telephone or other device is connected in parallel with the modem, the combined RENmust not exceed 4. A BT supplied telephone may be assumed to have REN of 1.0 unless otherwise noted.

The approval of this modem for connection to the British Telecom public switched telephone network is INVALIDATED if the apparatus is subject to any modification in any material way not authorized by BABT or if it is used with or connected to:

i. internal software that has not been formally accepted BABT.

ii. external control software or external control apparatus which cause the operation of the modem associated call set-up equipment to contravene the requirements of the standard set out in BABT/SITS/82/005S/D.

All other apparatus connected to this modem and thereby connected directly or indirectly to the British Telecom public switched telephone network must be approved apparatus as defined in Section 22 of the British Telecommunications Act 1984.

Compliance with BS6789: Section 3.1 and Part 2

a. The modem is not capable of allowing Auto Call using '999' or other PABX emergency numbers.

b. Modes other than modes 1, 2, or 3 should not be used on the BT PSTN. This modem is a mode 1 device.

c. Users are advised to check the numbers entered during the Auto Call set up phase prior to dialing.

d. The user should not issue any sequence of commands to the modem which would cause the modem to exceed the maximum allowable pause of 8 seconds from the time the modem goes off hook until dialing begins.

e. For correct operation of the call progress monitor, the power has to be properly connected and switched on.

Compliance with BS6328 Part 1

a. The modem is not suitable for use on circuits with British Telecommunications signaling at a normal frequency of 2280 Hz.

b. The modem does not require signaling or otherwise employ the frequency range dc to 200 Hz.

c. The modem does not require dc from the Private Circuit for correct operation. The modem may be damaged if connected, in a private circuit mode, to a circuit supplying dc current (the maximum permissible direct current is zero amps).

CE

EMC, Safety, and Terminal Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

and

Council Directive 98/13/EEC of 22 March 1998 on the approximation of the laws of the Member States concerning telecommunications terminal and satellite earth station equipment.

Appendix B: WINMCSI Workstation Redirector

Introduction

***Note**: This material is for IP or IPX network users only.*

This section describes how a client PC can use the MCSI (pronounced *miksee*) software redirector to access the RAS*Express* server's modems when using standard communications software.

WINMCSI.EXE is a Windows application for use with either IPX or IP networks. COMMAP.EXE can be used with either IPX or IP networks.

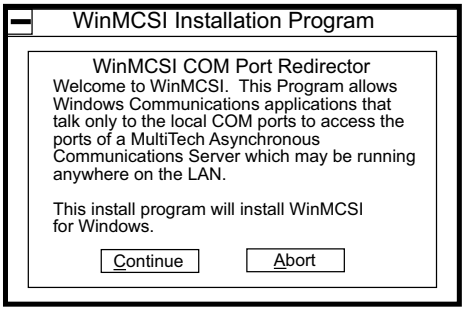
Installing and Configuring the WINMCSI Redirector

The WINMCSI modem-sharing program manages access to a modem for inbound and outbound calls. It allows Windows communications software packages that do not support INT6B or INT14 to connect to Multi-Tech gateways such as RASExpress. It also detects other compatible communications servers on your network and displays the resources they provide to eligible LAN users.

WINMCSI Installation

Windows95/98, or Windows NT:

1. Turn on your client PC and log in to your LAN.
2. Start Windows.
3. Insert the CommPlete 4000/Mini-Array III CD-ROM into the CD-ROM drive.
4. Go to **Start** | **Settings** | **Control Panel**.
5. Double-click the **Add/Remove Programs** icon.
6. The **Install/Uninstall Program** menu appears. Click **Install**.
7. Click **Next**. If you want to install WINMCSI as a 32-bit program, let Windows locate the proper Install.exe file on the CD-ROM. If you want to install WINMCSI as a 16-bit program, type **a:\winmcsi\install.exe d:\software\Wsredir** and go to the next appropriate subdirectory (for Windows NT, go to the "NTmcsi" subdirectory; for Windows 95/98, go to the "W95mcsi." Then specify the **install.exe** file.
8. Click **Finish**.
9. The WINMCSI Installation Program window appears.


WinMCSI Installation Program
WinMCSI COM Port Redirector
Welcome to WinMCSI. This Program allows Windows Communications applications that talk only to the local COM ports to access the ports of a MultiTech Asynchronous Communications Server which may be running anywhere on the LAN.
This install program will install WinMCSI for Windows.
Continue
Abort

10. To continue with the WINMCSI installation, click **Continue** and go to step 11.

If you do not want to install WINMCSI, click the **Abort** button .

11. The **WINMCSI Install Configuration** window appears.

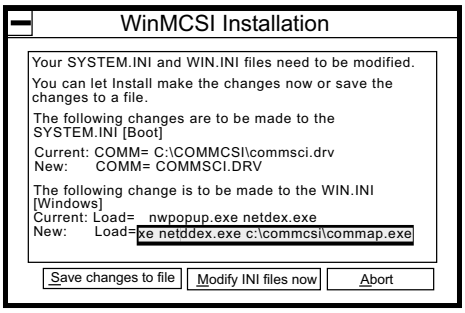
    In the **Destination Directory** box, type the name of the directory where you want to install WINMCSI, if you do not want to accept the default, C:\COMMCSI. Under **Network Type**, select the appropriate network type (IPX, NetBIOS, or IP).

    *Note**:** If you choose **IP** in the **Network Type** box, you must have a TCP/IP protocol active with the default IP router matched with the local IP address of the RASExpress server.*

12. Click **Continue**.

13. When the **Installing Multi-Tech WINMCSI** dialog box appears, click **Install**.

14. When installation is complete, the **WINMCSI Installation** dialog box appears.



15. Click **Modify INI Files Now** to have WINMCSI make changes to your SYSTEM.INI and WIN.INI files.

    Click **Save Changes to File** to have WINMCSI make a copy of the changes to be made and store them in a file. You must make the changes yourself before you can run WINMCSI.

    A screen appears later that tells you your installation is complete, and where your WIN.INI and SYSTEM.INI files are backed up. If **IP** was selected in the **WINMCSI Install Configuration** dialog box, the screen also asks if you want to set up the IP server list. Answer appropriately.

16. The following message appears:

    □□□□

- Click **Unmap** if you want to unmap a line.
- Click **Search** to search for lines on a server.
- Click **Close** when finished.

19. The following message appears:

    ▫▫▫

Appendix C: RADIUS Authentication & User Profile Software

Requirements

Radius Server requires a 486-66 MHz or faster computer, preferably running Microsoft Windows NT Server. Although Radius Server can also run on Windows 95, Windows 98, and Windows NT 4.0 Client, on those operating systems it is not possible to use the NT Server user database. The computer should have a hard disk, a CD-ROM drive, and LAN or WAN access.

Radius Server requires approximately 420 kB on the hard disk and space for the user database.

Installing Radius Login Authentication Software

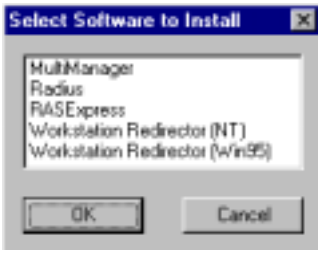
MultiTech's Radius software allows the CommPlete 4000 RAS Server to operate in conjunction with a general LAN server using Windows 95, 98, or NT4.

1. On the Radius Server computer, exit all Windows programs except Windows Explorer.

2. Insert the compact disc supplied with your Multi-Tech Systems communications server into the computer's CD-ROM drive.

3. If Autorun does not display the installation menu, find Autorun.exe in the root folder of the compact disc, and double-click it. The installation menu appears.

4. In the **Select Software to Install** dialog box, select **Radius**.



The Multi-Tech Radius Server Setup wizard will appear.

5. Follow the instructions in the Setup wizard to install Radius Server.

6. When the **Settings** dialog box appears, click **OK**. The default values are appropriate in most cases. Descriptions of each field on the **Settings** dialog box can be viewed in the section "Radius Server Properties" directly following this procedure. Also, you can change these settings at any time when Radius Server is running.

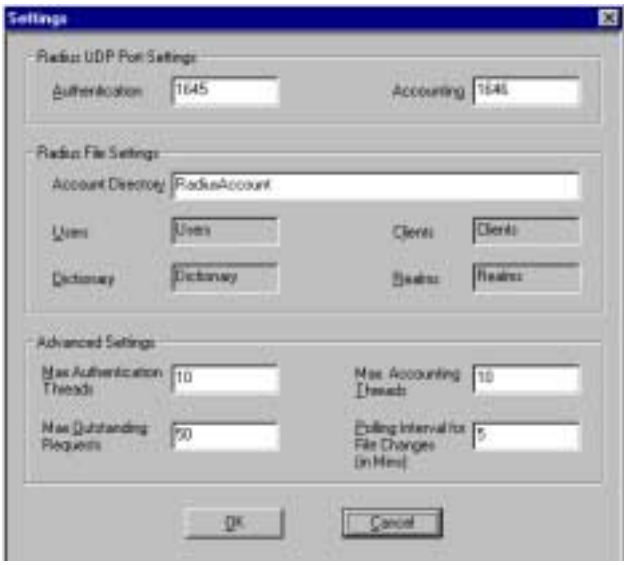
7. Click **Finish**.

8. Re-boot the computer. By default, Multi-Tech Radius Service runs automatically on startup. If for any reason the Radius program was shut down, you can launch the program manually from the Windows "Start" menu.

14. To shut down the Radius program, click on the Radius icon at the lower left of the PC screen.

Radius Server Properties

When Radius Server is running, the Radius Server icon appears in the Taskbar tray. To configure Radius Server, right-click the icon and select **Properties** from the context menu. The following dialog box appears:



Authentication

The RADIUS server port number. The default port number (1645) is required for Radius Server to work with RASExpress.

Accounting

The RADIUS accounting port number. The default port number (1646) is required for Radius Server to work with RASExpress.

Account Directory

The path where accounting logs are stored.

Dictionary

The name of the dictionary file. The dictionary file is an ASCII text file containing translations for parsing requests and generating responses. This name cannot be changed.

Clients

The name of the clients file. The clients file is an ASCII text file containing the IP addresses and shared secrets of the clients (RASExpress servers) served by Radius Server. This name cannot be changed.

Users

The name of the users file. The users file is an ASCII text file that lists authentication and configuration information for each user. This name cannot be changed.

Realms

The name of the realms file. The realms file is an ASCII text file that lists authentication servers to which a specific authentication request can be forwarded. This name cannot be changed.

Max Authentication Threads

The maximum number of threads that can be run at one time to perform authentication operations.

Max Accounting Threads

The maximum number of threads that can be run at one time to perform accounting operations.

Max Outstanding Requests

The maximum number of requests that can be queued up for processing.

Polling Interval for File Changes

The period in minutes after which the configuration files (users, realms, clients) are polled to check whether they have been modified recently. If they have been modified, the corresponding data structures are then dynamically updated.

Radius Software: "Clients" and "Users" Files

After installing the Radius software, the administrator must customize the "Clients" file and the "Users" file for use in their specific network system. These files can be found in C:\Program Files\MultiTech Systems\Radius Server. The "Clients" file and the "Users" file can both be opened in Notepad or Wordpad text-processor application programs.

In the "Clients" file, the administrator specifies the IP address of the RAS Server and the "shared secret" known to both the CommPlete 4000 RAS server and to the password authentication server. Entries in the "Clients" file must be in this form:

<IP address of client> <blank or tab(s)> <shared secret> <new line>

The IP addresses should be in dotted notation only. Names are not permitted.

For Windows NT only. In the "Users" file, the administrator lists network users by name and specifies authentication/password parameters. The "users" file can include another file which contains a list of users. The syntax is as follows:

$include <full path to the users file>.

When this command is employed under Windows NT, the authentication server can use the same user database as the host server.

The first line in each user entry contains the following information:

<User name> <Tab> <Check List>

The <User name> field must start from the first column. The <Check List> field can have the following info :

(i). Auth-Type. This field specifies whether the authentication is done locally or by the system (for WindowsNT only). Values: Local or System.

(ii). Password = <The password of the particular user>

Indicates that PAP is the authentication protocol.

(iii). CHAP-Password = <The password of the particular user>

Indicates that CHAP protocol is the authentication protocol.

(iv). Prefix and Suffix.

The "users" file can also have DEFAULT entries which have the user name as DEFAULT. These entries match on all users.

Concerning the notation, Fall-Through = 1 in the reply list,
=> the user entries which follow this user entry are also examined.

For NT Domain Authentication, the check list in the user entries can contain the attribute "Domain-name," to indicate the domain in which the user is authenticated. For NT Domain Auth to work properly, the person who has logged on should be given the rights "Act as part of the operating System" and "Log On as Batch Job".

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